

Notice of Allowability

Application No.

09/923,344

Examiner

Steven H. Rao

Applicant(s)

KUBO ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 10/24/2005.
2. ☒ The allowed claim(s) is/are 1-15 and 18-33.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 06/22/2005
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Response to Amendment

Applicants' amendment filed on October 17, 2005 has been entered and forwarded to the examiner on October 21, 2005.

Therefore claims 1-15 and 18-33 as recited in the amendment are currently pending in the Application.

Information Disclosure Statement

Acknowledgment is made of receipt of Applicant's Information Disclosure Statement (PTO-1449) filed on June 22, 2005 are acknowledged.

All the cited references have been considered.

However the foreign patents and documents if any cited by applicant are considered to the extent that could be understood from the abstract and drawings.

Allowable Subject Matter

Claims 1-15 and 18-33 are allowed.

The following is an examiner's statement of reasons for allowance:

The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitation of the dependent claims, in such manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims (1), (18) , (19), (24) (25) (27) and (28) which include A liquid crystal display device comprising : a first substrate; a second substrate a liquid crystal layer disposed between the first substrate and the second substrate and a plurality of picture element regions each defined by a first electrode provided on a face of the first substrate facing the liquid crystal layer and a

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second electrode provided on the second substrate so as to oppose the first electrode via the liquid crystal layer sandwiched there between, wherein the first electrode includes a plurality of openings and a solid portion in each of the plurality of picture element regions, the liquid crystal layer is in a substantially vertical orientation state in each of the plurality of picture element regions when no voltage is applied between the first electrode and the second electrode, and when a voltage is applied between the first electrode and the second electrode, a plurality of liquid crystal domains are formed in the plurality of openings and the solid portion by inclined electric fields generated at respective edge portions of the plurality of openings of the first electrode, for producing a display by changing orientation states of the plurality of liquid crystal domains in accordance with the applied voltage, and wherein each of said liquid crystal domains includes. (a) first liquid crystal molecules oriented substantially parallel to a normal to the first substrate thereby defining an axis, and (b) second liquid crystal molecules existing around all lateral sides of said axis and radially inclined relative to the axis. (cl.1) , wherein, in each of the plurality of liquid crystal domains, assuming that a liquid crystal molecule included in the liquid crystal layer and positioned in a 12 o'clock direction ()n a display surface in regard to a center of each of said plurality of liquid crystal domains is inclined against the 1 2 o'clock direction on the display surface by an angle θ , the polarization axis of one of the pair of polarizing plates is inclined in the same direction as inclination of the liquid crystal molecule positioned in the 12 o'clock direction on the display surface by an angle exceeding θ degree and smaller than 2θ against the 12 o'clock direction on the display surface. (Cl . 10), at least some of the

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plurality of openings have substantially the same shape and the same size, and form at least one unit lattice arranged so as to have rotational symmetry, and wherein each region 01' the solid portion surrounded with at least some of the plurality of openings is in a substantially circular shape.(Cl. 18) , at least some of the plurality of openings have substantially the same shape and the same size, and form at least one unit lattice arranged so as to have rotational symmetry, and wherein each region of the solid portion surrounded with at least some of the plurality of openings is in a substantially rectangular shape with substantially arc-shaped corners (cl. 19) when a voltage is applied between the first electrode and the second electrode, only a single liquid crystal domain is formed in each of the plurality of openings and only a single liquid crystal domain is formed in one each ()f the plurality of unit solid portions by inclined electric fields generated at respective edge portions of the plurality of openings of the first electrode, and wherein at least one of said liquid crystal domains includes: (a) first liquid crystal molecules oriented substantially parallel to a normal ()f the first substrate thereby defining an axis that is substantially normal to the first substrate, and (b) second liquid crystal molecules existing around all lateral sides of said axis and radially inclined relative to said axis (Cl. 24), when a voltage is applied between the first electrode and the second electrode, a liquid crystal domain is formed in each ()f the plurality 01- unit solid portions by inclined electric fields generated at respective edge portions of the nonsolid portion of the first electrode, wherein the liquid crystal domain includes first liquid crystal molecules oriented substantially parallel to a normal of the first substrate thereby defining an axis that is substantially normal to the first substrate, and second

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liquid crystal molecules existing around all lateral sides of said axis and radially inclined relative to said axis. (Cl. 25), wherein each liquid crystal domain for a corresponding opening defined in the solid portion of the first electrode includes liquid crystal molecules which are inclined and symmetrically oriented around all lateral sides of a vertical domain axis (SA) located in the corresponding opening, and wherein at least one liquid crystal molecule along the vertical domain axis (SA) at each openings is oriented in a vertical state when the substantial voltage is applied and wherein at least some liquid crystal molecules on opposite sides of the vertical domain axis (SA) of each opening are inclined in opposite directions. (Cl. 27) and wherein each liquid crystal domain for a corresponding opening defined in the solid portion of the first electrode includes liquid crystal molecules which are inclined and oriented around all lateral sides of a vertical domain axis (SA) located in the corresponding opening.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is (571)272-1718. The examiner can normally be reached on 8.00 to 5.00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fahmy Wael can be reached on (571) 272-1714. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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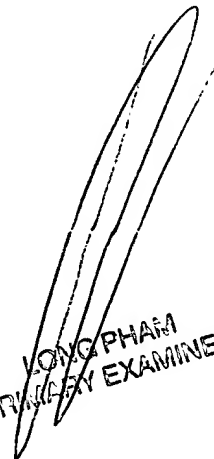
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Steven H. Rao

Patent Examiner

December 20, 2005.



VONG PHAM
PRIMARY EXAMINER